Dear referee,

Thank you very much for your comments and suggestions.
All our changes are in boldface in the text or described in this text.

Major comments:

- I think that the paper would benefit from a reduction of about 20-30% of the text. In particular, the discussion sounds somewhat repetitive and not concise.

We have worked on the text. Some comments from section 5 and 7 were moved to discussion and in several sections the text was shortened. We delete several paragraphs. In the parts where the text was modified, it was marked in bold. The main text is 27 pages, including figures (not counting the appendices), which we consider a reasonable length. We think that a greater reduction of the text could be negative for the understanding of our detailed study.

- I suggest the authors to dedicate some sentences in the introduction to explain the importance of deriving the physical, chemical, and dynamical properties of HH objects in the general framework of star formation studies (for example, what is the role of shocks in the natal environment of protostars)?

We have included in the first paragraph of the introduction an overview of Herbig-Haro objects in the context of star formation processes, as well as references to several articles that study the subject in great detail. However, we consider that adding another paragraph on the importance of physical, chemical and dynamical conditions in the context of star formation is beyond of the scope of the paper.

- For all species, the abundance is calculated by summing up the contribution of the ionized species, but nothing is said about the neutral ones. Although the authors do not report the complete list of the detected lines, I think that lines of neutral species have been detected, and this is certainly the case of OI. Please clarify why neutral species do not contribute to the calculation of the total abundances. If this is not the case, please add a sentence to clarify this point.

We detected several lines of neutral elements, mainly [OI], [CI] and [NI]. All the abundances were calculated relative to the H^+ abundance. In the case of O, the similarity between the ionization potentials of O and H allows us to assume that if O is neutral then H is neutral as well. In the case of a well mixed gas without lumps of different chemical composition (as expected in HII regions) it can be assumed that $(O^+ + O^{2+})/H^+ = O / H = O^0/H^0$. In the case of C, the ionization potential is even lower than that of H. Due to their close ionization potentials, it is also expected that the amount of N^0/H^+ is negligible inside the ionized gas volume. Furthermore, the neutral nitrogen may be affected by the absorption of Far Ultra Violet continuum radiation which populates its higher electronic states (Ferland et al. 2012ApJ...757...79F). This mechanism is particularly important in the Orion Nebula.

- In Fig.8, the total abudance of O^{2+} increases with the distance from the bow-shock although the temperature shws the opposite behavior. I understand that is a density effect, nevertheless it would be nice to have a short discussion about this apparently constrasting results

Indeed it is a density effect. In a Herbig-Haro object whose emission comes mainly from shock heating, it is expected that the radiation from ions with higher degree of ionization will come from the hottest areas, where the shock has dissipated a greater amount of kinetic energy. In that case we would expect that the abundances of ions with high degree of ionization increases with temperature. However, although we showed in section 9.3.1 that the cooling zone contributes strongly to the emission of [OIII], the bowshock shell along with the jet are in photoionization equilibrium. Therefore, the degree of ionization will be controled by the ionization parameter *U*, which is the ratio of the ionizing photon flux to the gas density. At greater distances from the bowshock, the density decreases and the ionization parameter increases, which increases the proportion of O in the form of O^{2+}. This implies a decrease in O^{+}, but as we noted in Section 5.2, a factor 2 increase in O^{2+}, represents less than 1% of the O total abundance (which is practically only in the form of O^{+}).

Minor comments:

Abstract: write the meaning of CELs and RLs

Done.

Introduction: Among works dedicated to the study of HH objects in the Orion nebula, I signal the one by Giannini et al. 2015, ApJ 815, 52 on HH1

This interesting work, as well as others related to its field of study, have been included in the introduction.

Sec.2, p.3,ll.134-136 and fig.1. Looking at fig.1 it seems to me that the emission from HH204 is indeed well separated from the other two also in cut1 (in the forbidden lines). Maybe this is a visualization problem, but can you quantify the contamination ?

It is true that in cut 1, some CELs of low ionization degree ions such as [OII], [NII] or [SII] could be easily deblended from the emission of the Orion Nebula and HH204 since the DBL has a strong emission of these ions. However, as it is shown in Figure 23 (Fig.22 in this revised version), the emission of ions such as [OI] or [OIII] is very weak in the DBL and the presence of the strong emission from HH204 modifies the surrounding continuum and makes very difficult to deblend the emission of the DBL from the Orion Nebula. It is a problem that does not make much sense to solve, since in cut 2 the nebular emission can be more easily separated from the DBL, and since the emission of these two ionized gas components is relatively homogeneous throughout the slit, we do not lose any information. Given the homogeneity in the emission of the aforementioned components, the contamination of the nebular emission by the DBL in cut 1 can be quantified by subtracting the emission measured in cut 2.

Also, the [OI]6300 has a completely different emission pattern than the [OI] and [OIII] lines. Have you an explanation for that?

Yes, we pointed out this in section 9.3.2. The interpretation of this result is that there is an ionization front trapped in HH204. The photons that ionize HH204 come from behind the bowshock, from θ^1 Ori C (O'dell, et al. 1997AJ....114.2016O). Since the degree of ionization is proportional to the ionization parameter *U* --which is inversely proportional to the electron density--, it drops when approaching the bowshock, where the density is higher. At a distance of ~9.5 mpc from the bowshock, the density is high enough “shield” the area and trap the ionizing photons, increasing the emission of [OI].

Sec.2, p.3,l.145. Please give the central wavelengths of the HST filters

Done.

Sec.2, p.3,l.165 : typo: extintion

Done

Sec.4.1 p.3 l.190. In many parts the present paper refers to the metodology described in PaperI. In my opinion it is useful for the reader to have here a brief summary, in order to have at least a general idea of the applied diagnostics and the maximum likelihood procedure.

It is a reasonable proposition. Each time we refer to a methodology used in Paper I, we try to give a general idea of the procedure, leaving aside some technical details. Even so, in section 4.1 we have included some lines highlighted in bold to make the idea clearer.

Sec.4.2 p.5 l.251. Again, please summarize here the method adopted to compute ionic abundances.

In this case, the phrase "We follow the same methodology described in Paper I" is only to show that we have been consistent with our approach of 3 ionization zones. In Sec. 4.2, we explicitly describe what temperature we have adopted for each ionic abundance.

Sec.4.3 p.7 l.386. Can you comment on a possible cause of the discrepancy in the line ratios? Do you think this can be to erroneous atomic parameters of these lines?

We consider that there are errors in the transition probabilities computed by Bautista (2001) for the mentioned lines. Although we discuss it in section 5.2 and in paper I, we have included a sentence in section 4.3 to emphasize it.

Sec.5.2 p.11 l.612. Can you comment on the physical reason of such correlation, for example in terms of dust grains disruption?

In the case of Cl and S, the correlation is mainly due to the similarity of the ionization potentials of the ions. It is not clear if there is a significant amount of Cl or S depleted in dust grains.

Sec. 5.2 Fig.9 I note that thr RLs determinations are systematically lower than the CEL ones. Can you give a comment on that?

In Fig 9, there are some areas where it seems that the estimate of RLs is somewhat higher than that of CELs. However, there is no a clear trend and in the integrated spectrum analyzed in section 4, the abundances of RLs are slightly lower than those of CELs. The small difference in Fig.9 is probably due to errors – that are difficult to estimate pixel by pixel-- when measuring the faint OI 7771 line. This is mentioned at the end of section 6, where we consider it better to use the spatially integrated spectrum of HH204 to obtain the abundance of O^+ with RLs. Anyway, we have added extra information in section 5.2 to clarify this.

Sec.6 - Please give the reason why neutral species are not considered in the total abundances calculation. Or the ICF consider such contribution (write the meaning of ICF)

The fundamental reason has been mentioned in the third comment of this report. In general, Ionization Correction Factors (ICFs) -- its meaning is given in section 5.2-- are factors to consider the contribution of ions that are present in the same volume occupied by H^+, whose abundance cannot be calculated directly because their emission lines are not detected in the spectrum. Of the ICFs used, none considers the abundance of neutral elements, since it is estimated that their contribution within the volume of ionized hydrogen must be very small. However, some ICFs designed for helium do consider the contribution of He^0/H^+ (see those analyzed in 2020MNRAS.496.2726M). However, in this work we do not estimate the total abundance of He.

Sec.7 I suggest the authors to shorten this section. This topic is somewhat complementary, so that a discussion of three pages sounds somewhat redundant

At this point we do not agree with the opinion of the referee. We consider that the exercise we present in this section is interesting in the analysis of ionized nebulae, in particular, in planetary nebulae, where the presence of several kinematic components with different physical conditions is rather common. Our message is that studying the chemical composition of various ionized gas components with a single low resolution spectrum does not necessarily give an "average representative abundance" and may introduce errors that can lead to incorrect physical interpretations. We think is important to describe this point in detail, since it has been the subject of debate in the field of ionized gas. Anyway, we have shortened the text as much as possible, so that we can express the same ideas, but with fewer words.